60p

# THE Unexplained

MYSTERIES OF MIND SPACE & TIME

113

Eusapia Palladino
Strange sounds of nature
Mu-the lost continent
Lightning calculators
Computer nets UFOs

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# THE Unexplained
## MYSTERIES OF MIND SPACE & TIME

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### In next week's issue

We describe a classic case of paranormal research involving a woman's dream and clairvoyant dowsing, in a new series on the **Swiss dream case**. Cities and battling armies that appear in the sky, and the Brocken spectre, which looms over climbers in the Harz Mountains, are the subjects of **Natural oddities**, while **Alien cats** takes a look at the numerous reports of big cats seen in Britain. We describe the work of **Queenie Nixon**, a transfiguration medium whose face reputedly takes on the likeness of deceased communicators. And the concluding article in the series **Rituals of magic** examines the practice of this art in the modern world – for both sinister and innocent purposes.

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# The phenomenal Palladino

**Eusapia Palladino, one of the most thoroughly investigated mediums of all time, was often detected in fraud. But, says ROY STEMMAN, she had genuine powers – that convinced even her most sceptical critics**

Eusapia Palladino at a Society for Psychical Research (SPR) investigation in 1909 (below) and in close-up (left). Her seances were usually noisy and full of action and variety

ANYBODY WHO SAT AT a seance with Eusapia Palladino could expect plenty of action: heavy furniture moved violently as though with a will of its own, materialised hands grabbed, clasped or stroked the sitters, horns hooted, lights flashed. Palladino produced these phenomena under extremely stringent conditions and did more than any other medium to convince psychical researchers that physical manifestations in the seance room were real – even though she was often caught out in fraud.

Eusapia Palladino was born into a peasant family in January 1854 near Bari in Italy. Her mother died while giving birth to her, and Eusapia became an orphan at the age of 12, when her father met a violent death by murder.

The centre of strange phenomena from an early age, she was only a teenager when her mediumistic powers were revealed. This came about in a remarkable way. In 1872 the English wife of an Italian psychical researcher called Damiani attended a seance in London. A spirit who identified himself as John King 'came through' and told her that there was in Naples a very powerful medium who was the reincarnation of his daughter,

Palladino lifts a table at a seance in Genoa, Italy, in 1906. Table-turning featured heavily in this medium's production of phenomena – sometimes, in fact, the tables became quite violent and even appeared to attack sitters

the famous Katie King (see page 1401). He then gave the full address of the house where this unknown psychic could be found. Damiani went there and, astonishingly enough, found Eusapia Palladino. He became the young girl's mentor and helped her to develop her powers.

The first scientist to declare his belief in Palladino's genuineness was Dr Ercole Chiaia. He did so in an open letter to Cesar Lombroso in 1888, after Lambroso, a well-known psychiatrist and criminal anthropologist, had written in an article that he and his friends laughed at Spiritualism. Chiaia invited Lombroso to witness a special case – Eusapia Palladino:

> Either bound to a seat, or firmly held by the hands . . . she attracts to her the articles of furniture which surround her, lifts them up, holds them suspended in the air . . . and makes them come down again with undulatory movements, as if they were obeying her will. She increases their height or lessens it according to her pleasure. She raps or taps upon the walls, the ceiling, and the floor, with fine rhythm and cadence. . . .
>
> This woman rises in the air, no matter what bands tie her down. She seems to lie upon the empty air, as on a couch, contrary to all the laws of gravity; she plays on musical instruments – organs, bells, tambourines – as if they had been touched by her hands or moved by the breath of invisible gnomes . . . .
>
> How many legs and arms has she? We do not know. While her limbs are being held by incredulous spectators, we see other limbs coming into view, without her knowing where they come from.

When Lombroso visited Naples two years later and accepted the invitation to sit with Eusapia Palladino, he was impressed. Indeed, as a result of his experiences with the medium, Lombroso spent many years investigating the paranormal; his books on the subject show that he finally came to believe that spirits of the dead were responsible for producing mediumistic phenomena.

### A staunch supporter

In 1892 a group of researchers known as the Milan Commission held 17 sittings with Eusapia Palladino. They issued a report that said, in part:

> It is impossible to count the number of times that a hand appeared and was touched by one of us. Suffice it to say that doubt was no longer possible. It was indeed a living human hand which we saw and touched, while at the same time the bust and the arms of the medium remained visible, and her hands were held by those on either side of her.

Unlike other mediums, Palladino did not sit behind a curtain during her seances. She did use a cabinet, which she claimed helped some of the phenomena build up, but she always sat in front of it. Whether she and her investigators sat in total darkness, or whether there was sufficient light to see her clearly, she always allowed the witnesses to tie her or hold her securely in the chair to satisfy themselves that she could not cheat.

Among the members of the Milan Commission was Charles Richet, professor of physiology at the Faculty of Medicine in Paris, who became one of her staunchest supporters. He conducted more than 100 seances with her and, as one of Europe's leading psychical researchers, was better placed than any other investigator to give a verdict on her psychic powers – a verdict that was favourable.

Professor Richet introduced various controls into his experiments with Palladino in order to prevent her cheating. In his book *Thirty years of psychical research* (1925), he tells of a table that was specially made for her seances:

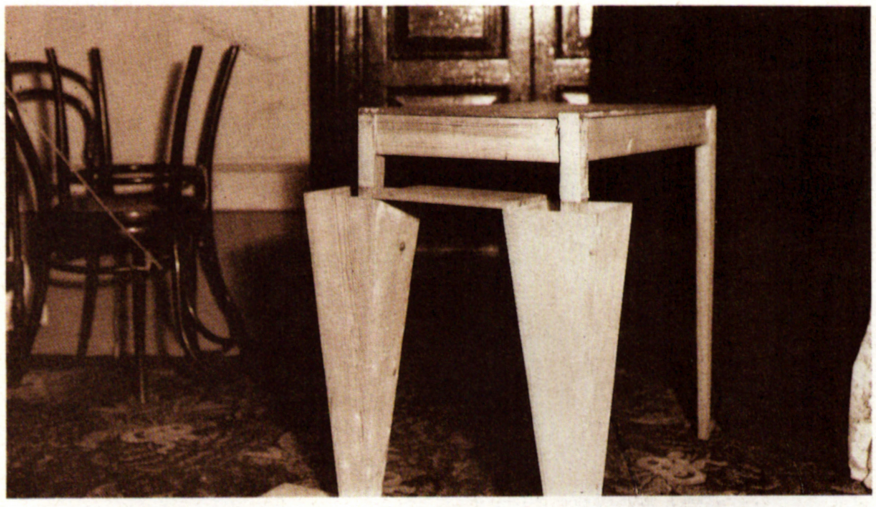
> The legs were pointed so that it would be difficult to raise it with the foot . . . .

> We thought it much too heavy (44 pounds) [20 kilograms], but we tried it the same evening. As soon as Eusapia touched this heavy table with the tips of her fingers, it tilted, swaying about, and without the legs being touched at all, it rose up completely with all four feet off the ground.

Tables feature prominently in accounts of Eusapia Palladino's mediumship. P. Foa, professor of pathological anatomy at the University of Turin, and a team of scientists, including one Dr Arullani, held a series of experimental seances with the medium. At one of these, she advised them not to touch any levitated objects because she would not be able to restrain their movements and someone might be hurt.

Immediately, one of the tables in the room floated into the air, over Professor Foa's head, and returned to the floor where it flipped over, then stood up on its legs again. At this point Dr Arullani approached it but, says the scientists' report:

> The piece of furniture moving violently towards him, repulsed him; Dr Arullani seized the table, which was heard to crack in the struggle . . . [it] passed behind the curtain . . . . Professor Foa saw it turn over and rest on one of its sides, whilst one of the legs came off violently, as if under the action of some force pressing upon it. At this moment the table came violently out of the cabinet, and continued to break up under the eyes of every one present. Dr Arullani . . . was invited by the medium to approach the cabinet. He had hardly reached it when he felt himself hit by pieces of wood and hands, and we all heard the noise of the blows.



Top: the table used by the SPR for testing Palladino was designed specially to detect fraud

Above: Charles Richet, a French physiology professor, and Cesar Lombroso (left), an Italian psychiatrist, were both convinced of Palladino's powers, despite their knowledge that she would sometimes cheat

In 1895 Palladino, already much investigated, visited England to give a series of seances at Cambridge for the Society of Psychical Research (SPR). This was after two of its founding members, F.W.H. Myers and Sir Oliver Lodge, had attended seances with her at the home of Professor Richet and had given favourable reports.

One of the witnesses at Cambridge was Dr Richard Hodgson, who suspected that Eusapia Palladino could not do anything without cheating (see page 1683). Although he was supposed to be controlling her movements, he deliberately relaxed his guard – and Palladino did cheat. The SPR pronounced her a fraud, but European investigators were unimpressed by this 'exposure'. They were aware that the medium would use trickery if given the opportunity, and had said as much in their reports. Their attitude was that, had the SPR controls been stringent, the phenomena would have been genuine.

### Moods of a medium

Camille Flammarion, a leading French astronomer, was another investigator of Eusapia Palladino. During one of the series of seances he conducted, he reported that the medium became very irritable and the phenomena became destructive:

> The sofa came forward when she looked at it, then recoiled before her breath; all the instruments were thrown pell mell upon the table; the tambourine rose almost to the height of the ceiling; the cushions took part in the sport, overturning everything on the table; [one participant] was thrown from his chair. This chair – a heavy dining-room chair of black walnut, with stuffed seat – rose into the air, came up on the table with a great clatter, then pushed off. . . .

Eusapia Palladino continued to produce convincing physical phenomena for Continental researchers, and eventually the SPR decided

Dr Richard Hodgson (left), a lawyer and noted psychical researcher, and Camille Flammarion (below), a famous astronomer, were among the many respected professional men who investigated Eusapia Palladino. Hodgson sat at the first of Palladino's seances at Cambridge in 1895 at which her cheating made British psychical researchers unwilling to test her again for some years

Below right: Palladino, with Everard Feilding (left) of the SPR, at the fourth of 11 seances held in Naples, Italy, in 1908. On her right is Professor Galeotti of Naples University. All the SPR investigators were particularly sceptical of Palladino – and all became convinced that the phenomena they witnessed were real

to re-open the case. In 1908 they sent a team of three to Naples to attend seances with her.

The members of that team were probably the most sceptical of all the SPR investigators – Everard Feilding, Hereward Carrington and W.W. Baggally. They concluded that the phenomena they witnessed, including levitation, movement of objects and the production of lights, raps and materialised shapes, were due to some kind of agency 'wholly different from mere physical dexterity on her part'. After the sixth of the 11 seances, which were held in a room at the Hotel Victoria in Naples, Feilding wrote:

> For the first time I have the absolute conviction that our observation is not mistaken. I realise as an appreciable fact of life that, from an empty curtain, I have seen hands and heads come forth, and that behind the empty curtain I have been seized by living fingers, the existence and position of the nails of which were perceptible. I have seen this extraordinary woman, sitting outside the curtain, held hand and foot, visible to myself, by my colleagues, immobile, except for the occasional straining of a limb while some entity within the curtain has over and over again pressed my hand in a position clearly beyond her reach.

A year later, however, Eusapia Palladino was caught cheating again, this time in the United States. She spent seven months in America from 1909 to 1910 and impressed many investigators. But at one of her seances a man managed to slip under the curtain of the cabinet and from that vantage point 'saw that she had simply freed her foot from her shoe and with an athletic backward movement of the leg was reaching out and fishing with her toes for the guitar and the table in the cabinet'.

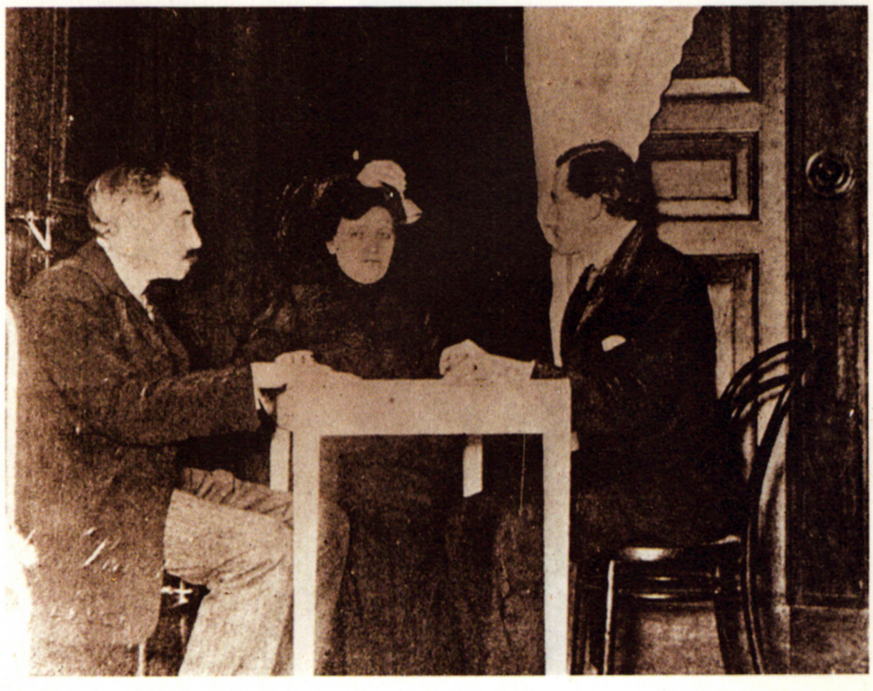
At another American seance a conjurer who concealed himself under the seance table caught her in deceit. But another, and more famous, stage magician, Howard Thurston, testified that the table levitations he witnessed in her presence 'were not due to fraud and were not performed by the aid of her feet, knees or hands'.

### Willed by the sceptics

The man who invited her to visit the United States was Hereward Carrington, one of the three SPR investigators sent to Naples, and after the unfortunate American episode he observed:

> Practically every scientific committee detected her in attempted fraud, but every one of these committees emerged from their investigations quite convinced of the reality of these phenomena, except the Cambridge and American investigations which ended in exposure.

The medium herself never denied that she



sometimes cheated. She explained that when she was in trance, she could be willed to play tricks by the sceptics among her sitters. But her defenders argue that some of the 'exposures' may have come from a mistake on the part of the observers, rather than from conscious or subconscious cheating on Palladino's part. It was common at her seances for limb-like objects to appear extending from her body, even when her hands and feet were clearly visible and being held. Perhaps, say her supporters, her detractors saw these ectoplasmic extrusions – called pseudopods – and mistook them for her own feet.

Whatever the truth about these phenomena, there is another aspect of Eusapia Palladino's mediumship that was not challenged and that, it seems, would be difficult to fake under the conditions that prevailed. At many of her seances, human-like forms or

Above: a drawing of how Eusapia Palladino was caught out in fraud at a Columbia University seance in New York in 1910. Although the medium did not deny that she occasionally cheated, the Americans never gave her another chance to prove that her powers were at least sometimes genuine

Left: Professor Enrico Morselli believed that he saw 'six phantoms' of human-like form appear at a seance with Palladino in Italy in 1902. Palladino was noted for her materialisations, some produced in fairly good light

parts of bodies materialised. Sometimes they were seen clearly and sometimes they were felt through the curtain of the cabinet by the researchers.

Professor E. Morselli and eight other researchers had a memorable experience of this phenomenon at a seance in Genoa on 1 March 1902. Morselli examined the medium and then tied her to a camp bed in a way that prevented her escaping. In fairly good light he and the others present saw six phantoms appear. Each time, as soon as the materialised figure returned to the cabinet, Morselli went to it immediately and found the medium still tied up, exactly as she had been left.

Professor Richet also testified to the medium's powers of materialisation: 'More than 30 very sceptical scientific men were convinced, after long testing, that there proceeded from her body material forms having the appearance of life.'

At a seance held on 16 June 1901, attended by Dr Joseph Venzano, several phantom hands materialised and stroked the sitters. Finally, they took hold of Venzano's hands:

> When my hand, guided by another hand, and lifted upwards, met the materialised form, I had immediately the impression of touching a broad forehead, on the upper part of which was a quantity of rather long, thick, and very fine hair. Then, as my hand was gradually led upwards, it came in contact with a slightly aquiline nose, and, lower still, with moustaches and a chin with a peaked beard.
>
> From the chin, the hand was then raised somewhat, until, coming in front of the open mouth, it was gently pushed forward, and my forefinger, still directed by the guiding hand, entered the cavity of the mouth, where it was caused to rub against the margin of the upper dental arch, which, towards the right extremity, was wanting in four molar teeth.

Dr Venzano recognised in the materialisation a relative who was very dear to him and who had died some years earlier. But he was not sure which teeth that relative had had missing. When he checked this later, he found that they coincided exactly with the gaps in the phantom's teeth.

Despite the fact that most of Palladino's investigators were convinced that she had genuine powers, the American 'exposure' marked the end of the medium's international career. For the next eight years, until her death in 1918, little was heard of her. But it is known that she continued to produce physical phenomena at seances in her own country.

To this day, Eusapia Palladino remains something of an enigma, and controversy continues about her manifestations. Without doubt, however, she was of the greatest historical importance to psychical research in the 20th century. Arguably, she was also the greatest medium of modern times.

# Paradise lost?

**The story of the lost continent of Atlantis is familiar – but was it the only land of its kind? Some 19th-century scholars believed that a similar kingdom, called Mu, once existed in the Pacific Ocean. ROY STEMMAN assesses the strength of their argument**

IN 1926 James Churchward, an Englishman living in India, published the results of a lifetime's research. His book, *The lost continent of Mu*, begins with these words:

> The Garden of Eden was not in Asia but on a now sunken continent in the Pacific Ocean. The Biblical story of creation – the epic of the seven days and the seven nights – came first not from the peoples of the Nile or of the Euphrates Valley but from this now submerged Continent, Mu – the Motherland of Man.

Churchward went on to say that he had discovered complex records that told of

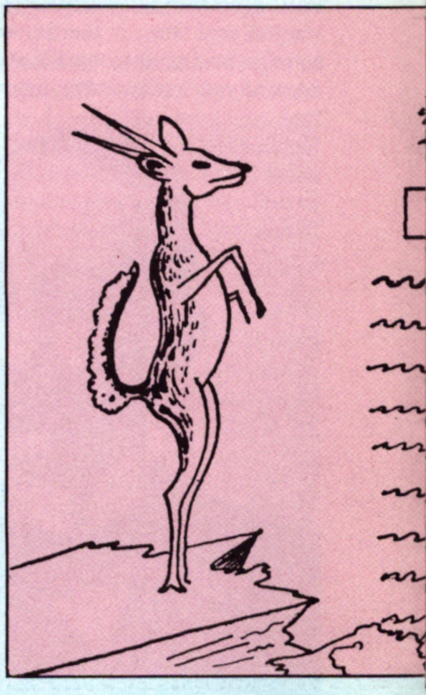
> this strange country of 64,000,000 inhabitants who, 50,000 years ago, had developed a civilisation superior in many respects to our own. They described, among other things, the creation of man in the mysterious land of Mu.

However the somewhat eccentric Churchward was not the first to have 'discovered' the story of the sunken continent of Mu. In 1864 a French scholar, the Abbé Charles-Etienne Brasseur de Bourbourg, had come across a treatise on the Mayan civilisation and a rare Mayan book and claimed – after translating it – that it told of a land that had been destroyed by a volcanic eruption, then engulfed by the waters of the ocean.

Although Brasseur's announcement excited great interest at the time it is now known that his translation was utterly wrong. In fact the treatise he had discovered in the library of the Historical Academy of Madrid had been written by Diego De Landa, Spanish Bishop of the province of Yucatan. The bishop was responsible for one of the most appalling acts of cultural vandalism: he had totally destroyed the Mayans' extensive literature with the exception of just three books.

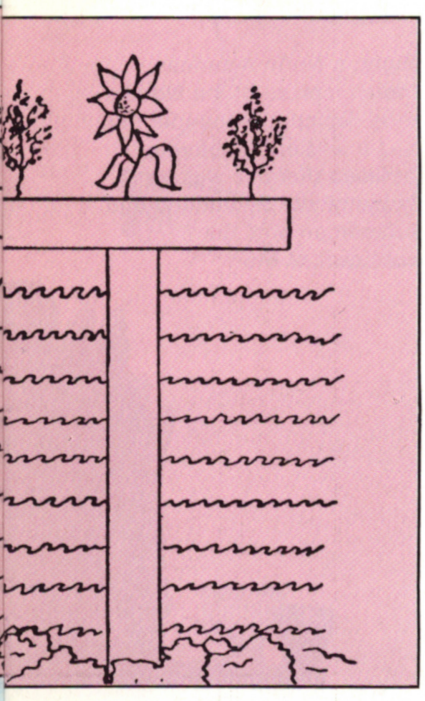
Ironically, once he had disposed of these irreplaceable records, De Landa became interested in the Mayan culture and tried to learn its writing: a complex system of word-glyphs. He compiled a 'Mayan' alphabet, which he included in his treatise *Account of the affairs of Yucatan*, and it was this that Brasseur used – together with a lively imagination – to 'translate' the *Troana codex*, half of the two-part *Tro-Cortesianus codex*, which is preserved in Madrid. (The other two books that escaped De Landa's destruction are preserved in Dresden and Paris.)

When other scholars tried to use the alphabet to decipher the remaining Mayan books the result was incoherent nonsense. To this day only a third of the Mayan glyphs are understood, but enough is known to say with certainty that the *Troana codex* is about astrology, not a volcanic eruption.



Below: Mu emerges from the Pacific in this illustration from James Churchward's *The sacred symbols of Mu* (1933). Churchward believed that this image came from a Hindu carving 2500 years old. Mu is represented by the symbol T, or *tau* – which, Churchward explained, meant 'the stars which bring the water'

Right: an ancient Mayan text known as the 'Dresden codex'. This and two other codices are all that remain of the once extensive body of Mayan literature; the remainder was destroyed in the 16th century. A 19th-century French scholar, the Abbé Charles-Etienne Brasseur de Bourbourg, believed that the manuscripts told of a lost continent. He called this land Mu – because two mysterious characters of the Mayan alphabet looked like M and U



But something had puzzled Brasseur in his translation. He was unable to account for two characters in the Mayan manuscript that bore a resemblance to 'M' and 'U' in De Landa's alphabet. So he put them together to give the submerged land a name – Mu.

Though his painstaking work has been discredited, Brasseur's name for the island lives on. The next chapter in the story of the lost continent was written by a fellow countryman of Brasseur, a physician and archaeologist of some repute, Augustus Le Plongeon. And the Mayans inspired his theories, too.

Le Plongeon was the first man to excavate the Mayan ruins in Yucatan, where he lived with his American wife Alice for many years. He made his own 'translation' of the *Troana codex*, influenced by Brasseur's work and by his interpretation of pictures on the walls of the ruined city of Chichen Itza. According to Le Plongeon, a very colourful account of life on Mu emerged.

Two Muvian princes, Coh and Aac, were rivals for the hand of their sister, Moo, the Queen of Mu. Prince Coh was the winner, only to be killed by his jealous brother, who then took over the country from the Queen. At the height of this incestuous drama Mu began to sink. Moo managed to escape, reaching Egypt where she built the sphinx as a memorial to Prince Coh. Under the name Isis she founded Egyptian civilisation.

Many other Muvians fled to South America where, at Yucatan, they recorded their history and erected temples to their leaders. As corroboration of his theory Le Plongeon claimed that the Mayan writing and Egyptian hieroglyphics are similar – an opinion unfortunately not shared by experts.

Augustus and Alice Plongeon went to live in Brooklyn in the 1880s and wrote several books about their discoveries, the best-known of which is *Queen Moo and the Egyptian Sphinx*, published in 1896 and still in print in the 1980s. In it, Le Plongeon claimed to have found Prince Coh's charred entrails in a stone urn during his excavations.

Left: the Sphinx gazes out over the desert near Cairo, Egypt. Mu-enthusiast Augustus Le Plongeon tells a colourful story of its origin. Apparently Moo, Queen of Mu, fled her native land after the competition for her hand in marriage had led to the death of one of her brothers. Arriving in Egypt, travelling incognito as the goddess Isis (right), she built the Sphinx as a memorial to her dead brother – and went on to found the Egyptian civilisation

### Immolation of a race

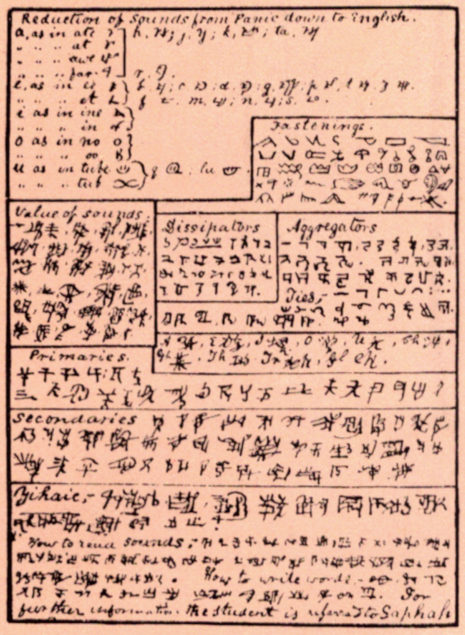
According to Le Plongeon, in his translation of the *Troana codex*, Mu,

> being twice upheaved . . . suddenly disappeared during the night, the basin being continually shaken by the volcanic forces. Being confined, these caused the land to sink and to rise several times in various places. At last the surface gave way and 10 countries were torn asunder and scattered. Unable to stand the force of the convulsion, they sank with their 64,000,000 inhabitants. . . .

Both Brasseur and Le Plongeon believed Mu and Atlantis were the same continent, the latter placing it to the east of central America, near to the Gulf of Mexico and the Caribbean Sea. Other theorists had sought to place Atlantis in the Atlantic. But if any ocean has gobbled up a continent, the Pacific would undoubtedly be the best candidate. It is, after all, the Earth's largest ocean – 68 million square miles (176 million square kilometres) – and twice as big as the Atlantic.

The first man to place a lost continent in

## Panic rising




One of the most extraordinary claims made for the existence of a Pacific continent appears in the writings of Dr John Ballou Newbrough, a New York dentist and Spiritualist medium. Through automatic writing he produced a book, *Oahspe: A Kosmon Bible in the words of Jehovah and his angel ambassadors.*

*Oahspe*, published in 1882, claims that Man appeared on Earth 72,000 years ago through the union of angels with seal-like animals. A map – presumably supplied by spirits – shows our planet in antediluvian times with a triangular continent, called Pan, which allegedly sank beneath the waves of the Pacific Ocean 24,000 years ago.

But this Pacific land has not been lost for ever. According to *Oahspe*, it will rise again, its re-emergence beginning in 1980. We will, it seems, have no difficulty in translating the records we find of Pan's civilisation: Dr Newbrough has supplied, in the *Kosmon Bible*, a Panic alphabet and dictionary (left).

Below: alleged evidence for the existence of Mu. In *The sacred symbols of Mu,* James Churchward claims this is 'one of the two oldest known bronzes in the world. It is a symbolical figure of Mu as the mistress and ruler of the whole earth. It was either in Mu or in the Uighur capital City over 18,000 years ago'

Right: a North American Indian tableau of the Nootka tribe depicting a thunder bird and a whale. Churchward believed that this was an image of the destruction and submergence of the continent of Mu

the Pacific was also a Frenchman, Louis Jacolliot, who had collected Sanskrit myths during a stay in India. Writing at about the same time as Le Plongeon, he claimed the myths told of a land named Rutas that had sunk in the Indian Ocean. But his own interpretation was that Rutas was a land mass that once covered the area now occupied by the Polynesian Islands.

Support for the theory grew in the 1880s as even more extraordinary claims were made, such as those put forward in the *Kosmon Bible Oahspe* (see box).

But even the extraordinary *Oahspe* cannot compete with Churchward's *The lost continent of Mu.* It is outrageous, but it makes fascinating reading; and soon after its publication, Churchward's name became synonymous with Mu. The book was still in print in the 1980s.

Churchward pieced together the story of Mu from various sources, the most important being two sets of inscribed tablets. The first he claimed to have discovered in India or Tibet (depending on which of his books we use as our source) in a temple where he was studying bas-reliefs. For two years the temple's high priest taught Churchward how to read the inscriptions on the walls, which he believed to be written in 'the original tongue of mankind'.

During this period of study the priest revealed that there were ancient tablets in the temple's secret archives, and Churchward persuaded him to open them up for examination. They were written in the same language he had been studying and, said Churchward, told of the Earth's creation and the appearance of Man on the continent of Mu. He called them the Nacaal tablets.

The second set of tablets that he believed shed more light on Mu were a collection of 2500 stone objects found in Mexico by an American engineer, William Niven. They had been made by the Aztecs and other ancient Mexican peoples and, whereas no one else found anything on them worth deciphering, Churchward alleged that they contained symbols that originated on Mu and, like the Nacaal tablets, contained extracts from the 'Sacred Inspired Writings of Mu'.

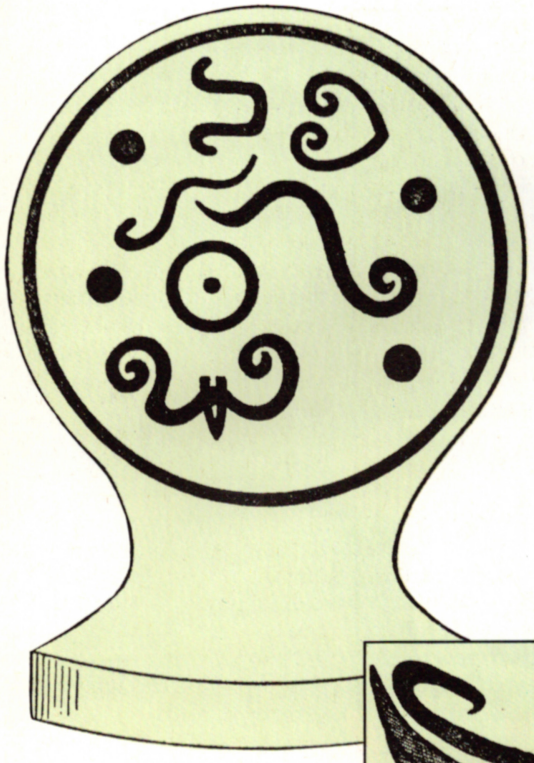
### Humming birds and mastodons

On the basis of this and other research, Churchward was able to describe the history of the lost continent in some detail. The inhabitants consisted of 10 tribes who were governed by a single body and had an Emperor, the Ra Mu. The vast continent was covered with plains of rich pastures and tilled fields. Mountains, he adds, 'had not yet been forced up from the bowels of the Earth'. There were rivers and wooded hillsides, brightly coloured butterflies and humming birds, and huge mastodons and elephants.

There were several races on Mu, with yellow, brown and black skins, but Churchward claimed that the white race of 'exceedingly handsome people, with clear white or olive skins, large, soft, dark eyes and straight black hair' was the dominant one.

It was an idyllic place. On cool evenings pleasure ships were filled with bejewelled men and women; they rejoiced at their good fortune. But all good things must come to an end.

The southern parts of Mu were suddenly shaken by earthquakes and volcanic eruptions. Many of her cities were destroyed. The



Left: a fine sandstone tablet from Mexico, carved with glyphs used only by the Naga people. Churchward bought this from an Indian in Mexico, who claimed he had found it in a ruined building. *The sacred symbols of Mu* contains an extensive 'translation' of the glyphs that provides extra fuel for Churchward's hypothesis of the destruction of Mu

Below right: a volcano erupts. Mu-enthusiasts believe that the continent met its end in a scene similar to this one – and many are convinced that such a fate will shortly befall our own civilisation

land was awash with tidal waves. Eventually the survivors were able to rebuild their homes, and life continued. But the ultimate disaster had merely been postponed – when it came, many generations later, almost all of its inhabitants perished.

Churchward's account of Mu's demise reads like an eyewitness account of the disaster. The whole continent 'heaved and rolled like the ocean's waves' and then 'with thunderous roarings the doomed land sank. Down, down, down she went, into the mouth of hell – "a tank of fire".'

Mu was finally covered by 50 million square miles (130 million square kilometres) of water. But even that was not enough to obliterate the great continent. The earlier volcanic eruptions on Mu had caused lava to build up into high cones and now, with the disappearance of the land beneath the waves, they were the only visible evidence of the continent's existence. We know them today as the Pacific Islands.

Survivors clung to these chains of islands, but with no food, no clothing and no shelter these previously peace-loving people soon turned into cannibals in order to survive. The colonies – including Atlantis – survived for a while, but without the motherland's help they soon declined. Some 1000 years after Mu's disappearance, wrote Churchward, Atlantis suffered a similar fate.

Why did this extraordinary story convince so many people? Probably because it seemed to solve the mystery of Easter Island and others in the area. Churchward wrote:

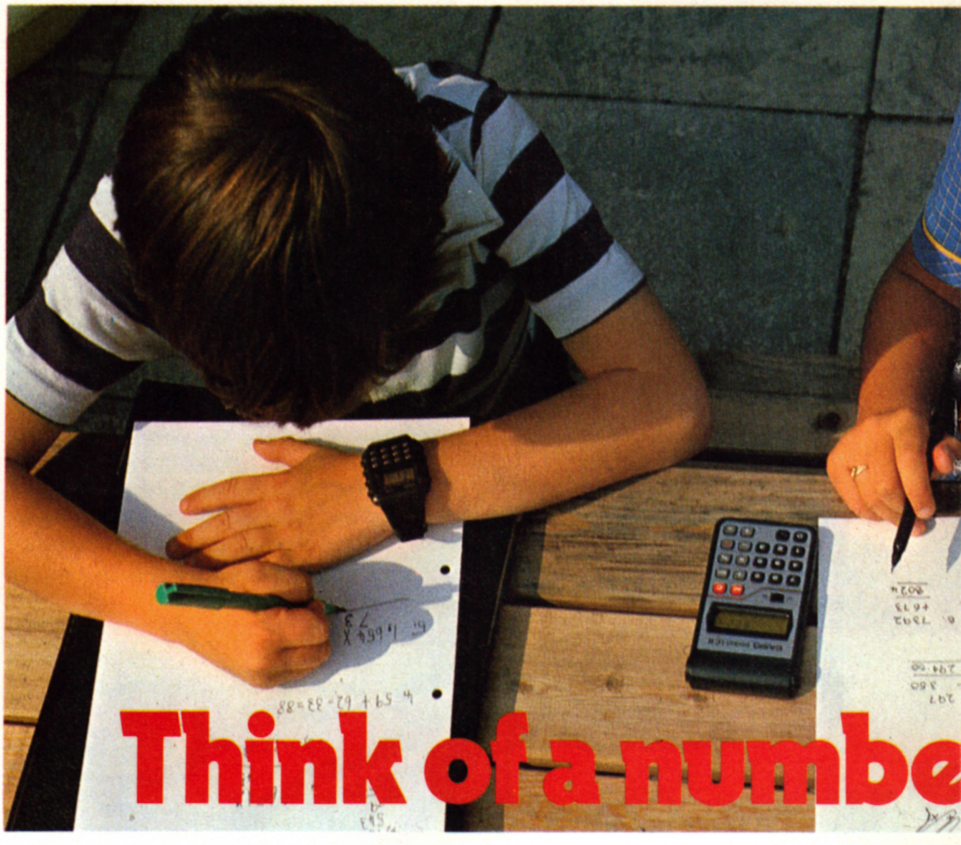
> On some of the South Sea Islands, notably Easter, Mangaia, Tongatabu, Panape, and the Ladrone or Marianas Islands, there stand today vestiges of old stone temples and other lithic remains that take us back to the time of Mu. At Uxmal, in Yucatan, a ruined temple bears inscriptions commemorative of the 'Lands of the West, whence we came'; and the striking Mexican pyramid southwest of Mexico City, according to its inscriptions, was raised as a monument to the destruction of these same 'Lands of the West'.

But there is no need to invent a lost continent to solve the mystery. Thor Heyerdahl's *Kon-Tiki* expedition and subsequent research on Easter Island has demonstrated that it is possible that the Pacific Islanders may well have had cultural and trading links with South America. The Easter Island mystery is no argument for a lost continent.

However appealing the story of Mu may be, we can safely say that the continent never existed. Yet belief in it continues and it clearly needs more than all the cold water in the Pacific to be poured over it before the legend, like the continent, is lost for ever.

*Are lemurs the only survivors of the lost island of Lemuria? See page 2286*

**The phenomenal feats of mental computation achieved by a few remarkable people have astonished observers as being far beyond the normal human capability for calculation. ARCHIE ROY examines some of these supernova performers**




IN TODAY'S AGE of the cheap pocket calculator many of us are in danger of losing whatever arithmetical skill we may once have possessed. In former times a shop assistant confronted with six similar items at 25p each would make an instant mental calculation that 25p × 6 = £1.50 and would punch that figure on the cash register. Nowadays in the same situation the shop assistant will solemnly punch 25p six times. Whereas children once mastered the 12 times table as a basic skill, they now use their trusty calculator to discover, say, what 4 × 9 equals.

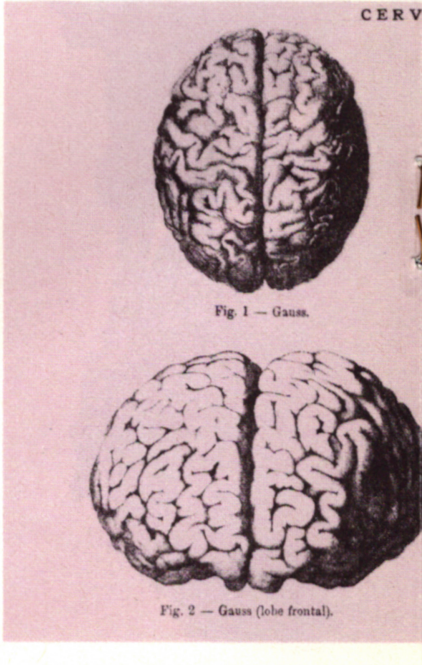
Compared with previous generations most of us are arithmetically illiterate. But in past centuries there have been human beings whose calculating ability has so far outshone that of their contemporaries and predecessors that mathematicians, scientists and psychologists have been astounded. Appearing at random like meteors these 'lightning calculators' demonstrate that the human brain is capable of feats that remain largely unexplained.

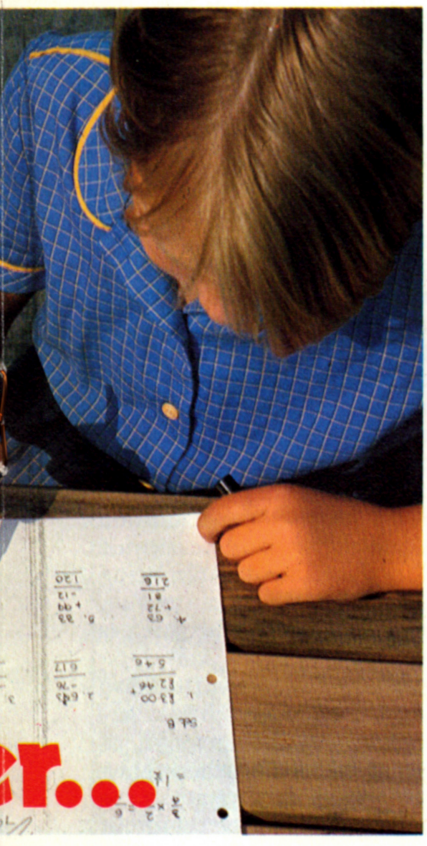
Some of these lightning calculators have been exceptionally gifted in other spheres of human activity; others, in contrast, have exhibited a stupidity that threw their strange talent into bizarre relief. The only thing common to most of them is that they demonstrated their extraordinary gift in early childhood. With some it lasted throughout their lives; with others it departed after a few years. Like the infant musical prodigies Chopin and Mozart, who played brilliantly and composed at an early age, the mathematical prodigies seem to have been either self-taught or simply endowed with their ability.

The Irish mathematician Sir William Hamilton (1805–1865) is a good example of someone with exceptional all-round ability. He began to learn Hebrew at the age of three, and by the time he was seven a fellow of Trinity College, Dublin, said that he showed a greater knowledge of the language than many candidates for a fellowship. By the age of 13 he knew at least 13 languages. Of his early mathematical ability a relative said, 'I remember him a little boy of six, when he would answer a difficult mathematical question, and run off gaily to his little cart.'

The German mathematician and scientist Carl Friedrich Gauss (1777–1855) demonstrated an exceptional early ability to carry out mathematical calculations in his head. A story is told of the first day he attended the arithmetic class of his school, when he was aged nine. Almost as soon as the teacher had finished dictating some problems young Gauss threw down his slate with the remark, 'There it lies.' At the end of the hour the slates were checked: only Gauss's answers were correct. By the time he was 13 he was excused from further mathematics lessons; and many of his most important mathematical discoveries were made between the age

Skill in mental arithmetic was once vitally important to scientists. Sir William Hamilton (below left) and Carl Friedrich Gauss (right) were many-sided scientific geniuses who were also mathematical prodigies. After the death of Gauss anatomists pronounced his brain to be far more complex than that of a labourer (below)





of 14 and 17. He became the foremost mathematician of his age, publishing his book on the theory of numbers when he was 24; he also made notable contributions to astronomy. Throughout his life he demonstrated an astounding ability to remember numbers and to carry out calculations in his head at uncanny speed.

The multi-faceted brilliance of Hamilton and Gauss tends to obscure their extraordinary arithmetical skill. When we examine such people as Tom Fuller, Jedediah Buxton and Zacharias Dase however, the real mystery of this peculiar power becomes evident.

Some of the 18th-century African slave-dealers seem to have surprised the Europeans with whom they traded by their mental agility in calculating intricate deals. However one of their victims, Thomas Fuller, outshone the best of them. He was shipped as a slave to America, to the state of Virginia, where he became known as 'the Virginia calculator'. In 1780, when he was 70, he was tested by William Hartshorne and Samuel Coates; among the questions they asked him were the following.

'How many seconds are there in a year and a half?' Fuller gave the correct answer in about two minutes.

'How many seconds has a man lived who is 70 years, 17 days and 12 hours old?' In a minute and a half Fuller supplied the answer. When his questioners told him he was wrong, he pointed out that they had not taken into account leap years.

Fuller died in 1790. He never learned to read or write.

Another 18th-century illiterate who was nevertheless a mathematical prodigy was Jedediah Buxton, the son of an English village schoolmaster. In spite of his father's occupation, Jedediah steadfastly refused to be educated, and as an adult he could not even scrawl his own name. He seemed to have no interest in anything apart from calculating. In 1725 he remarked that he was drunk with reckoning. This was scarcely surprising for he had just answered, after a labour of one month (and without pen or paper), the following mammoth question. How many barley corns, vetches, peas, beans, lentils and grains of wheat, oats and rye would fill a space of 202,680,000,360 cubic miles? And also how many hairs, each an inch long (and taking 48 hairs laid side by side to measure one inch across) would fill the same space?

His ability to solve this and similar problems earned him a certain fame and in 1754 he was taken to London to be examined by

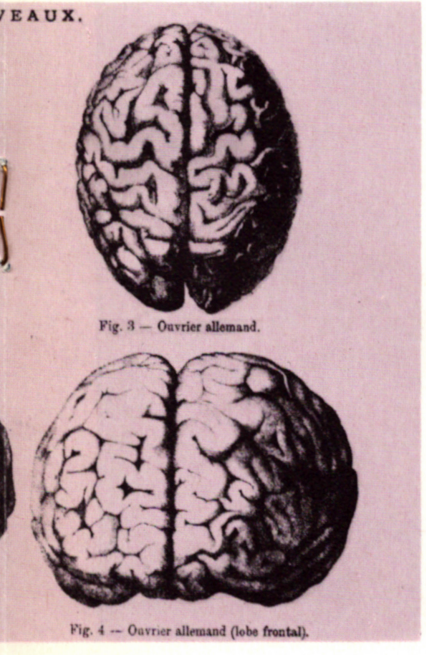



Fig. 3 — Ouvrier allemand.

Fig. 4 — Ouvrier allemand (lobe frontal).

## Tricks of the trade

Much of the labour of arithmetical calculations can be reduced by the use of a few simple tricks, and there can be little doubt that many of the famous lightning calculators used these. Those who professed not to know how they obtained their results may have used such methods subconsciously.

The following are some examples. If you want to test how much time and trouble they save, you should try solving the problems the long way – and time yourself!

*What is the square of 97?*

Instead of multiplying 97 by 97 in the conventional way, proceed as follows:

$$97 \times 97 = (100-3) \times (100-3)$$
$$= 10{,}000 - 300 - 300 + 9$$
$$= 9409.$$

*Multiply 197 by 104*

$$197 \times 104 = (200-3) \times (100+4)$$
$$= 20{,}000 - 300 + 800 - 12$$
$$= 20{,}488.$$

*What is the square root of 3249?*

Try approximate appropriate numbers:

$50^2 = 2500$ (too small)

$60^2 = 3600$ (too big)

Only $3^2$ or $7^2$ will give 9 in the last place. Try:

$$53^2 = (50+3) \times (50+3)$$
$$= 2500 + 150 + 150 + 9$$
$$= 2809 \text{ (wrong)}$$

Therefore the answer must be 57.

*What is the square root of 92,416?*

The required number must lie between 300 and 310, since $300^2$ (90,000) is too small, and $310^2$ (96,100) is too big. Looking at the last two digits, we find the number that gives 16 when squared (4). So the square root must be 304.

*What is the square root of 321,489?*

To find the appropriate numbers (in hundreds) around which to test, look at the first two digits (32). The square of 5 is 25 and the square of 6 is 36, so the square root will lie between 500 and 600. Looking then at the last two digits, we ask what number squared ends in 89? The answer is 67. So the square root must be 567.

Mnemonic devices can be used to remember numerical formulas that crop up frequently, such as the value of $\pi$ (the ratio of the circumference of a circle to its diameter) to 12 figures. This is $\pi = 3.14159265359$.

The formula can be memorised by means of the following couplet, in which the number of letters in each word gives the number of each digit:

See, I have a rhyme assisting
My feeble brain its chore resisting.

Although dodges such as these have undoubtedly helped lightning calculators, they do not explain the astonishing ability demonstrated by many of them at such an early age.

The son of a village schoolmaster, Jedediah Buxton (left) refused to learn to read and write but showed an extraordinary talent for mental computations. He excelled in very long problems that took weeks to solve, all without benefit of pen and paper. Archbishop Whately (below) was also a calculating prodigy, but his powers deserted him when he started school

the Royal Society. He visited Drury Lane theatre to see Shakespeare's play *Richard III*, but his response to this theatrical experience was to count the number of times each actor appeared and left the stage and the number of words each one spoke.

### Travelling genius

A 19th-century mathematical wonder was Zacharias Dase, who was born in 1824. His extraordinary ability in mental arithmetic became evident quite early in his life, and as his fame grew he travelled extensively throughout Europe, becoming acquainted with eminent scientists such as Gauss and the German astronomer Johann Encke. Dase seems to have had wider intellectual horizons than Buxton and Fuller, and wished to use his calculating genius in the service of mathematics and science. Since he was able to multiply and divide large numbers in his head, he was able to create mathematical tables at incredible speed. By 1847 he had calculated the natural logarithms for every number between 1 and 1,005,000 to seven figures. The length of time he required for any mental calculation was dictated by the size of the numbers involved. In one test he multiplied together the numbers 79, 532, 853 and 93,758,479: it took him 54 seconds. Multiplying two numbers each of 20 figures took him 6 minutes; two numbers each of 40 figures took 40 minutes; and two of 100 figures each took him $8\frac{3}{4}$ hours! And all this was done without writing anything down.

Although he was anxious that his talent should be used to further the cause of science, he had, unfortunately, no ability beyond his gift. Many people thought he was stupid. One teacher tried for six weeks without success to teach him the basics of mathematics. Geometry was a closed book to him. And yet in spite of all this he did in some sense achieve his ambition. In 1849, on the recommendation of Gauss, the Hamburg Academy of Sciences gave Dase financial support to create tables of factors and prime numbers between 7 million and 10 million. He was still at this colossal task when he died in 1861.

Other lightning calculators were Richard Whately (1787–1863), archbishop of Dublin, whose powers left him when he went to school, Vito Mangiamele, the son of a Sicilian shepherd, and the American boy Zerah Colburn.

Vito Mangiamele was aged 10 when he was tested by the astronomer François Arago before the French Academy in 1837. To the question, 'What is the cubic root of 3,796,416?' the child gave the correct answer in half a minute. It took him less than a minute to provide the answer (which is 5) to the question, 'What satisfies the condition that its cube plus five times its square is equal to 42 times itself increased by 40?' On being asked to supply the 10th root of 282,475,249, the little boy gave the answer '7', which is correct.

Zerah Colburn's talent seems to have appeared almost overnight. At first considered backward, he showed no sign of arithmetical ability at his village school; then one day his father heard him reciting the multiplication tables to himself without error. Soon his father was exhibiting young Colburn at various places in the United States, and he took him to England in 1812. Now eight years old, Zerah was bombarded with questions such as, 'What is the square root of 106,929?' Without hesitation he could

The American child prodigy Zerah Colburn at the age of eight. He was exhibited by his father as a mathematical marvel, and astounded observers by his seemingly magical ability to answer the calculating problems with which he was bombarded

## The human slide rule

Born in 1806, George Bidder (right) was the son of an English stonemason. While still quite young, he was taken about the country by his father to exhibit his calculating prowess. People would test him with complicated questions such as: 'How many drops are there in a pipe of wine, if each cubic inch contains 4685 drops and each gallon contains 231 cubic inches, and assuming there are 126 gallons in a pipe?'

Bidder was highly intelligent, and his fate was quite different from that of other lightning calculators such as Buxton, Colburn and Dase. He not only went to school but subsequently attended Edinburgh University, where he won the mathematical prize in 1822. He became one of the foremost engineers in Britain, working both for the Ordnance Survey and later for the Institution of Civil Engineers, of which he became president. He is regarded as the founder of the London telegraphic system and is credited with the design of the Victoria Docks in London. An expert in civil engineering in an era when England's railway system was being created, Bidder was much sought after.

Unlike Archbishop Whately, who lost his outstanding calculating abilities at an early age, Bidder's powers actually improved as he grew older. According to a fellow of the Royal Society, he had 'an almost miraculous power of seeing, as it were, intuitively what factors would divide any large number . . . given the number 17,861 he would instantly remark it was 337 × 53.' He was not, apparently, able to explain how he did this; 'it seemed a natural instinct to him.'

Bidder passed on his gift to his son, George Bidder QC. Although not as brilliant a reckoner as his father, Bidder junior was a noted mathematician who could multiply a 15 figure number by another 15 figure number in his head. Two of Bidder's granddaughters also showed considerable dexterity in mental arithmetic.

The theory that the right hemisphere of the brain (the one less used by most, right-handed, people) might be more active in lightning calculators was put forward in 1903 by the psychical researcher Frederic Myers. As evidence for this he cited the fact that both Bidder QC and Edward Blyth, another 19th-century engineer and lightning calculator, were left-handed, indicating that their dominant hemisphere was the right one. However it is not possible to determine now whether any of the earlier lightning calculators were left-handed; nor is it possible to say with certainty that the gift can be inherited. The mystery remains, one facet of the larger mystery of the human brain.

answer '327'. To the question, 'What is the cube root of 268,336,125?', he could give the answer '645' just as readily. He was also able to say whether a large number was a prime number (one that cannot be evenly divided) or, if it was not, he could give its factors (the numbers that multiplied together give the original large number). For example, if he was given the number 4,294,967,297, he said that it was equal to 641 × 6,700,417.

Zerah Colburn never seems to have excelled in any other activity; he died at the early age of 35.

### Common denominators

Dr E.W. Scripture made a study of such lightning calculators, and collected accounts of many more than those described here. As a psychologist he was naturally interested in trying to discover how such arithmetical prodigies achieve their astounding results. While his studies do not clear up the mystery completely, they do give us a glimpse behind the curtain, so to speak.

Scripture pointed out that in order to carry out their calculations and to store a multitude of numbers in their memories for long periods of time the lightning calculators need to have exceptional memories. Buxton, Fuller, Dase and Colburn all gave evidence of possessing remarkable memories, often in areas other than computation. Possession of total recall would also enable the results of past calculations to be available for future operations, in much the same way that the 12 times table, once learned, is available to the ordinary mortal. Various conversion constants, such as the number of seconds in a year, or the number of inches in a mile, once assimilated, would be readily available for future calculations.

Mathematical prodigies are not all male. In 1981 ten-year-old Ruth Lawrence won an open scholarship to Oxford University in competition with over 500 students almost twice her age. She was assessed by the university as being possibly the most brilliant maths student ever seen in Britain

Scripture also suggested that other characteristics of the lightning calculator were rapid recall, a love of arithmetical computations and arithmetical short cuts, mathematical precocity and a good visual imagination. He concluded that a combination of these factors in a human being will produce a lightning calculator.

What he did not explain is why such characteristics are found in particular individuals such as Colburn, Mangiamele, Dase and Bidder (see box). If it is a question of heredity, what special constellations of genes would be necessary to create such persons? How is it that a few brains can perform supernova feats of computation that make the ordinary person's mathematical skills appear primitive? At almost any level of consideration, the lightning calculator remains an unexplained phenomenon.

# Sounds mysterious

**Why do sands around the world produce weird booms, roars, squeaks and whistles, and coastal waters echo to mysterious explosions? OLIVIA MACDOUGALL analyses some of the mysterious sound effects created by nature**

THE BRITISH PHYSICIST R.A. Bagnold was travelling on a field trip in the desert area of south-west Egypt when he and a companion had a strange and unnerving experience:

> It happened on a still night, suddenly – a vibrant booming so loud that I had to shout to be heard by my companion. Soon other sources, set going by the disturbance, joined their music to the first with so close a note that a slow beat was clearly recognized. This weird chorus went on continuously for more than five minutes before silence returned and the ground ceased to tremble.

The phenomenon of singing sands is only one of the weird sound effects nature can produce. Similarly voluble sands – that sing, bark, boom, roar, squeak and whistle – have cropped up in travellers' tales for over 1500 years. The earliest references are in chronicles from the Middle and Far East; Marco Polo in the Middle Ages described an example of the phenomenon in the Gobi Desert, and Charles Darwin remarked upon a case in Chile in the 19th century.

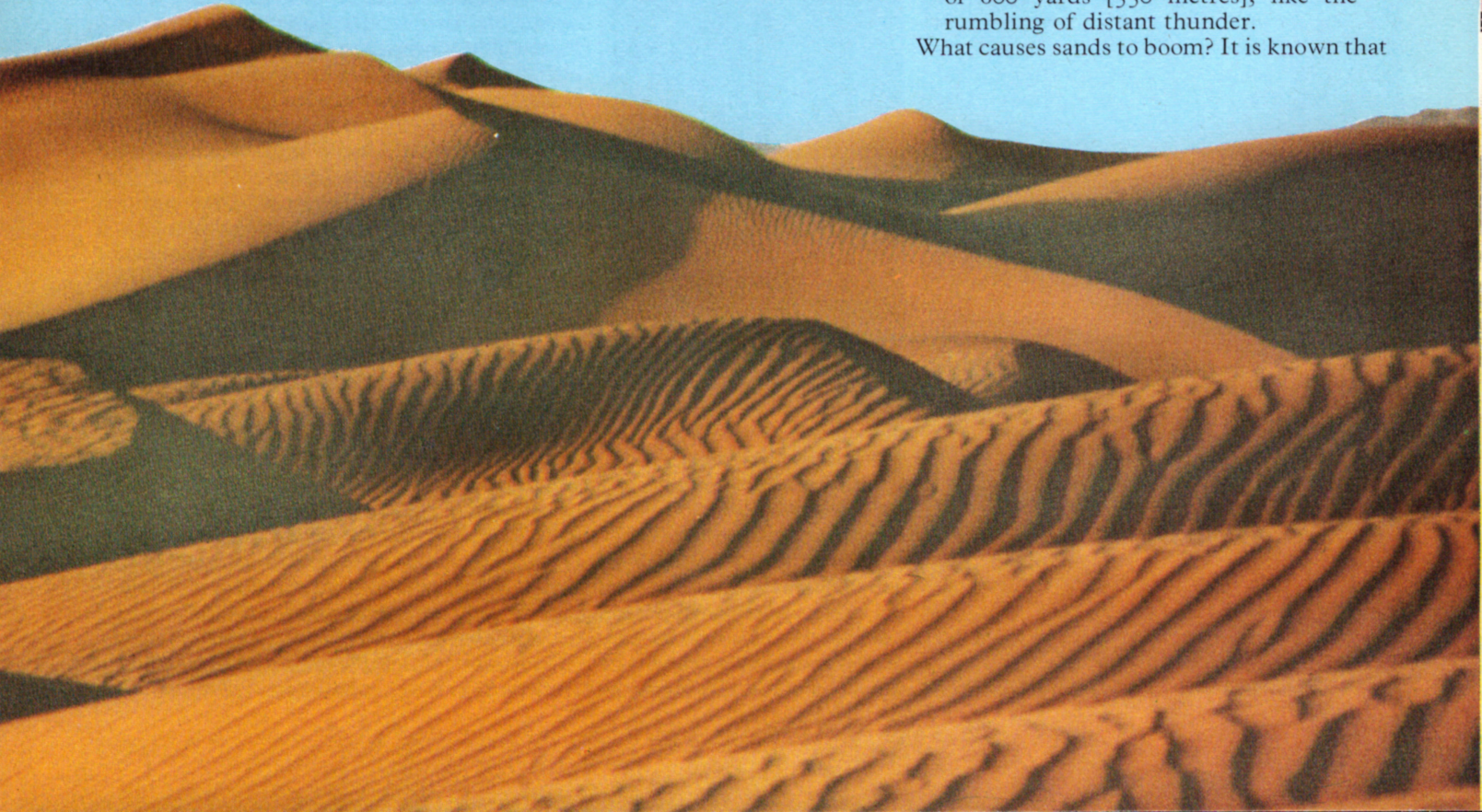
A seventh-century account from the Tun-Huang-Lu manuscript, preserved in the British Museum, gives a description of a rumbling dune in China that appears to have been used as a kind of fairground side-show at festivals. In Khotan, the account reads, is a sandhill that at certain times gives out strange noises:

> The hill of sounding sand stretches 80 li [25 miles or 40 kilometres] east and west and 40 li [13 miles or 20 kilometres] north and south. It reaches a height of 500 feet [150 metres]. The whole mass is entirely constituted of pure sand. In the height of summer the sand gives out sounds of itself, and if trodden by men or horses, the noise is heard 10 li [3 miles or 5 kilometres] away. At festivals people clamber up and rush down again in a body, which causes the sand to give a loud rumbling sound like thunder.

A similar example was reported by an early investigator, A.D. Lewis. He described a rumbling dune in the Kalahari Desert of South Africa in 1935 as follows:

> By sliding down the slope in slow jerks on one's 'sit upon' . . . a very loud roar is produced. In the still of the evening and early morning, natives were kept sliding down the slope in this way, and the noise was easily heard at a distance of 600 yards [550 metres], like the rumbling of distant thunder.

What causes sands to boom? It is known that



In a desert landscape one would expect to find profound silence. Yet such places can be wildly noisy – even, according to at least one account, making it necessary to shout to be heard by someone nearby

the continuous internal movement of sand within the dune, whether it occurs naturally or as a result of human intervention, can, under certain conditions, produce a low-frequency vibration of around 50 to 100 hertz. This is audible as a hum that can sound like the pure note of an organ or of a double bass. The presence of overtones can produce a sound more reminiscent of the rumble of thunder or the drone of bumble-bees or of low-flying aircraft. Seismic waves accompanying the sound have also been recorded; these ground vibrations can sometimes manifest themselves as mild electric shocks.

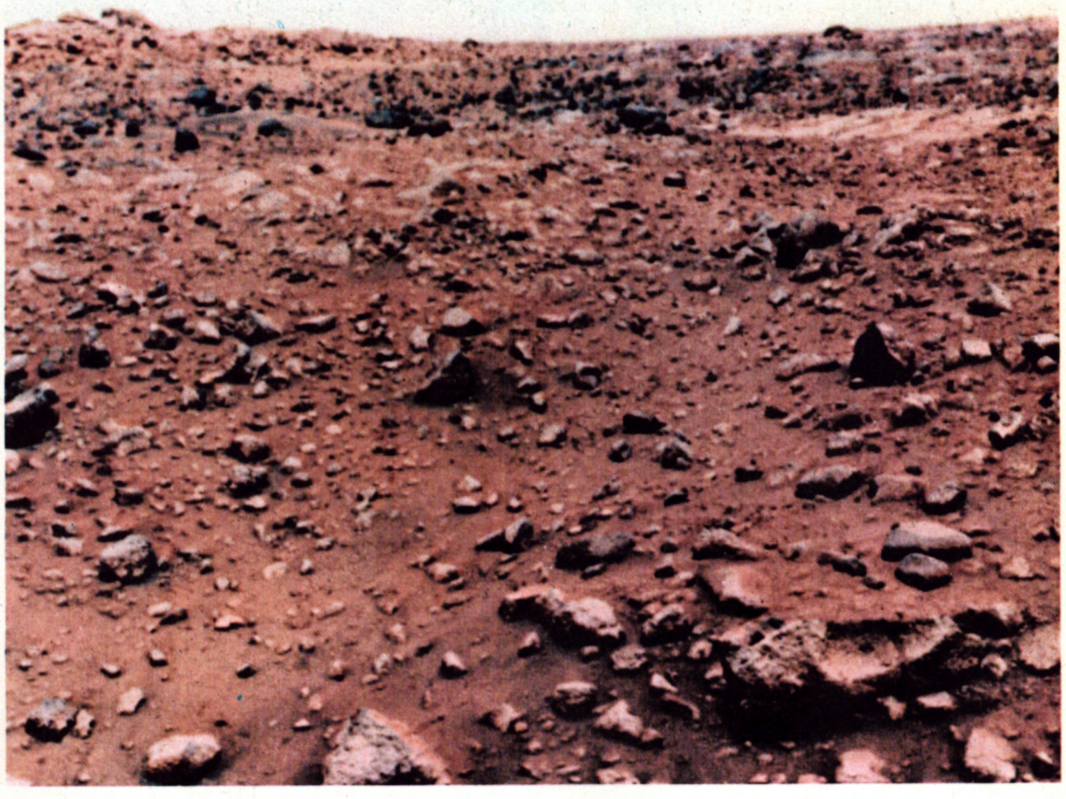
The actual mechanism that produces the vibrations is, however, far from being completely understood. It has been conjectured that the hum may originate as an oscillation of individual grains of sand caught between sliding masses of sand; or perhaps the key to the phenomenon lies in the way in which the grains are packed together. Windy conditions and dryness are essential for producing booming sand – so it has been suggested that booming sand may be common on the windy and almost waterless deserts of Mars.

Sand dunes are generally found in remote regions, far from what might be called the 'noise pollution' of the 20th century. Acoustic phenomena that occur in more densely populated areas are often more difficult to isolate, and run the risk of being misidentified. So it is with the mystery detonations known in Europe as mistpouffers. These are dull, seemingly distant explosions heard all around the European coast and as far into the Atlantic Ocean as Iceland. They are also heard in the North American and Asian coasts. The most famous example is found in Barisal, now in Bangladesh, and is known as the Barisal guns because the sound is like that of the firing of big guns. One G.B. Scott gave this report in *Nature* magazine in 1896:

Marco Polo arriving at the court of Kubla Khan, as depicted in a 13th-century manuscript. Polo was one of the great travellers of history. In his account of his Asian journeys appears one of the earliest descriptions of 'singing sands' – in the Gobi Desert

> I first heard the Barisal guns in December 1891, on my way to Assam from Calcutta through the Sunderbans. The weather was clear and calm, no sign of any storms. All day the noises on board the steamer prevented other sounds from being heard; but when all was silent at night . . . the only sounds the lap of the water or the splash of earth, falling into the water along the banks, then at intervals, irregularly, would be heard the muffled boom as of

The south-west coast of Bangladesh near the city of Barisal. Along here are heard the Barisal guns, so named because the sound over the water is like the firing of heavy artillery. One report written in the 19th century said it sounded like the 'muffled boom as of distant cannon'



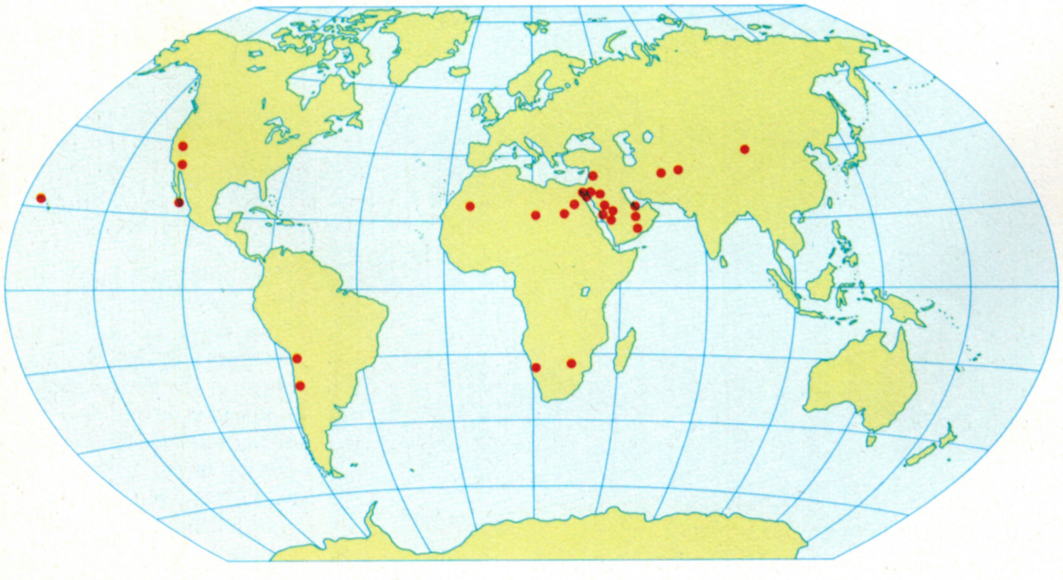
The planet Mars. Scientists say that the windy and almost waterless conditions on Mars are ideal for booming sands – but no one has yet had the opportunity to hear them

> distant cannon. Sometimes the reports would resemble cannon from two rather widely separated opposing forces, at others from different directions but apparently always from the southward, that is seaward.

Suggested explanations for the Barisal guns have been many and varied: they could result, perhaps, from explosions of vast methane bubbles rising from the ocean floor; they could be caused by seismic activity on the ocean bed – although, curiously, there is no correlation between the mysterious detonations and seismic records; they could be caused by the sonic boom of meteorites falling through the atmosphere faster than the speed of sound. The explanation remains elusive: the question, for some reason, has become one of those curiosities of the natural world that is overlooked by scientists.

A quick explanation was sought with more urgency when a series of mysterious explosions hit the east coast of North America in December 1977. Residents of New Jersey and South Carolina in the United States and Nova Scotia in Canada reported mysterious booms accompanied by explosions. A Mrs Hattie Perry, of Barrington, Nova Scotia, who monitored the reports of the phenomenon, described it as follows:

> Some say it sounds as though a car has hit the side of a house. Others think that some missile has landed on the roof. One woman, lying in bed, was



This map shows the location of booming sands throughout the world. The noise normally occurs at the tips of large dunes

terrified to see the tiles on her ceiling pull apart, then close together again.

The booms were registered on sensitive seismic equipment at Columbia University's geological observatory, just outside New York city. The explosions were estimated as equivalent to the detonation of between 50 and 100 tonnes of TNT.

What caused the blasts? One explanation was that deposits of methane gas hidden under the continental shelf or along the shore suddenly ignited. Another was that they could have been due to the sonic boom created by Concorde as it flew close to the North American seaboard. True, the blasts were not heard at the time that Concorde flew over; but, it was argued, in the extremely cold weather conditions that obtained at the time, it would have been possible for the sonic boom wave, travelling upwards, to be reflected from a boundary between layers of cold and warm air. The reflected sound wave could then reach ground level a considerable time after Concorde had flown over the spot – a kind of sound mirage. A third suggestion was that the sonic wave came from unscheduled military test flights in the area.

Few scientists were prepared to lend support to the methane theory, and the Pentagon quickly denied any supersonic activity by military aeroplanes at the time. That left the possibility that the culprit was Concorde. The Canadian government took this idea seriously enough to request the British and French air authorities to change Concorde's route, because there had been reports of Concorde flying as close as 20 miles (32 kilometres) to the coast. From 17 February 1978 Concorde pilots were instructed to maintain a minimum distance from the Canadian coast of 50 miles (80 kilometres) – but reports of booms in Nova Scotia persisted.

What are we to make of the evidence? It is, of course, perfectly possible that the booms were caused by military aircraft on supersonic manoeuvres – but the Naval Research Laboratory, which was commissioned by the US government to investigate the phenomenon, remains evasive on this point. All one can do is to agree with the comment of Ernest Jahn, a scientific investigator for the National Investigations Committee on Aerial Phenomena (NICAP), who said, 'It is some kind of physical phenomenon which we simply don't understand.'

*On page 2266: spectres in the mountains; cities and battles in the sky*

## Anger of the gods

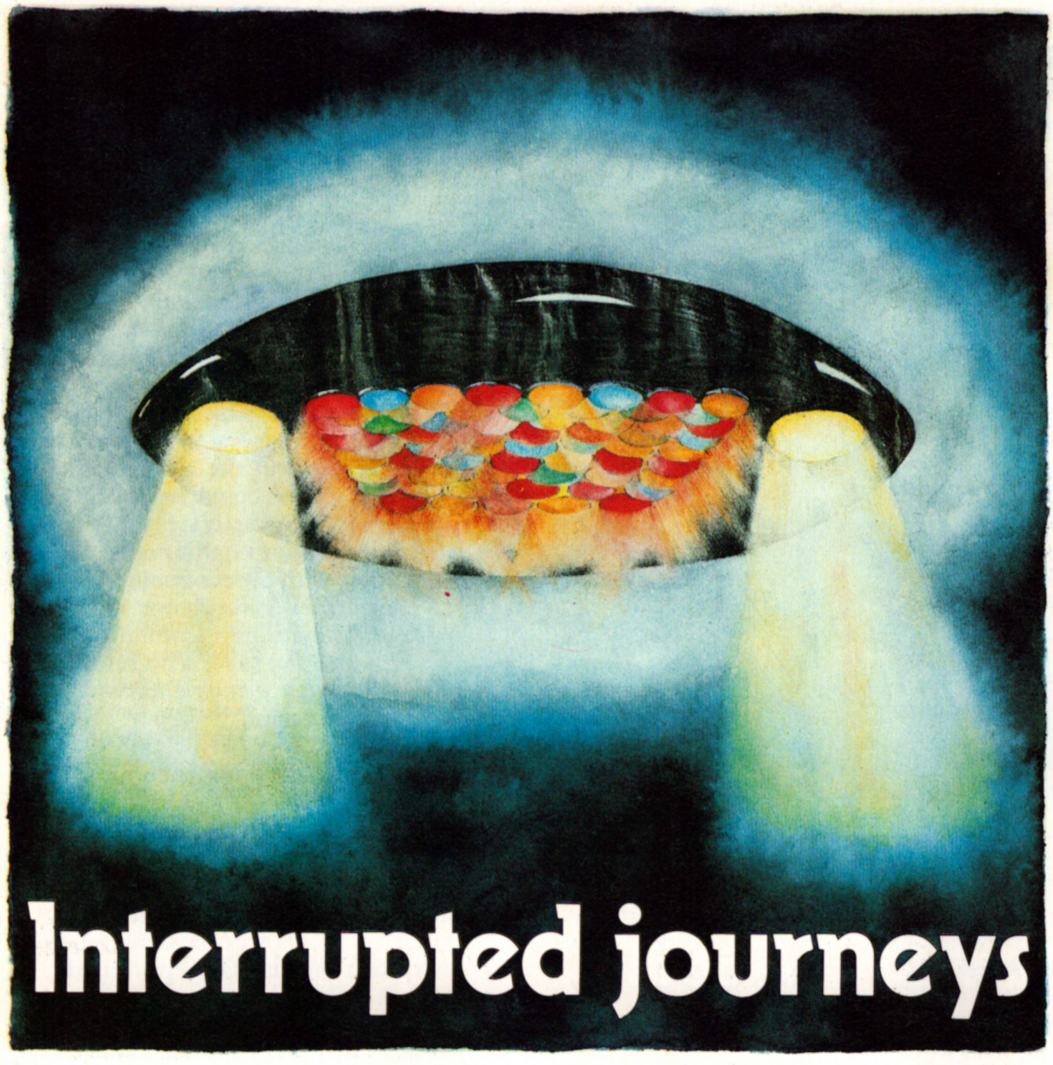
The inhabitants of the small town of East Haddam, Connecticut, USA, are used to hearing mysterious noises. The rumblings – known to the local American Indians long before the Europeans came – have shaken buildings, rattled crockery and even, on one occasion, allegedly thrown someone out of bed. Variously likened to cannon fire, a heavy log falling, thunder, or the passing of a heavy lorry, the sound was believed by the original inhabitants to be the ragings of the god Hobbamock. This god lived inside Mount Tom, which is situated to the north-west of the town. In the 17th century the Indians informed newly arrived European colonists that the god was expressing his anger at them as unwelcome settlers. The area of East Haddam in which the noises are most often heard is the hilly part called Moodus, which takes its name from the Indian Matchitmoodus or 'place of bad noises'.

Intriguing these noises certainly are, but they rarely appear to harm people or property. 'There's nothing to be afraid about; we're so used to it,' says Frances Kuzaro, the town librarian. 'Usually, your dishes will rattle and you might think it's the furnace in the cellar ready to blow up.' Other locals are equally dismissive: James Meyer, a high school biology teacher who wrote his master's thesis on the noises, comments: 'A lot of people don't bother listening to them any more. You hear a noise and assume it's something else – sonic boom, traffic.'

The noises do, however, definitely exist – and their origin has been studied by a group of seismic experts headed by Dr John E. Ebel. Ebel placed a network of five seismometers within a 10-mile (16-kilometre) radius of Moodus. This 'net', which was extremely sensitive, showed tiny earthquakes that matched reports of noises recorded by listeners whom Ebel employed in Moodus. 'Every one I've heard has been verified,' said Cathy Wilson, one of Ebel's volunteer listeners, 'except one, which turned out to be a gunshot.'

Ebel concludes that the noises are the result of shallow, low-magnitude earthquakes – 'micro-earthquakes', as he calls them. 'The surprising and unexpected result of my study,' Ebel comments, 'is the fact that the micro-earthquakes are so very, very shallow that they shake the surface in a way that makes it act like a loudspeaker, sending off the boom.'

This explanation seems more likely than previous ideas, which ranged from gaseous and chemical reactions far below the surface of the Earth to exploding gemstones. But how exactly does this happen? And why only at Moodus? Scientists remain puzzled – and the precise way in which the geology of the area allows the Earth's crust to act as a sounding board remains unknown.



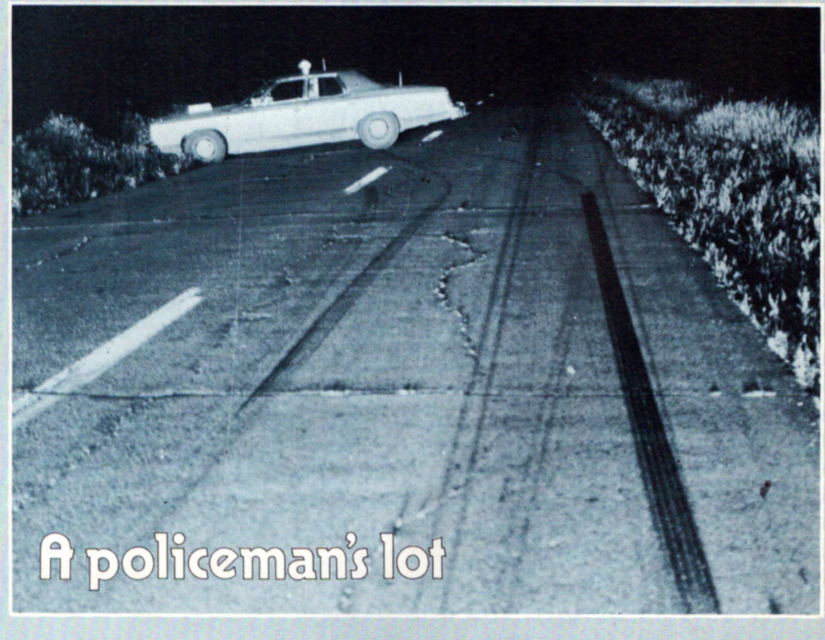
# Interrupted journeys

During an intense UFO 'flap' in Lancashire during early 1977, two factory workers had an encounter in the town of Nelson. At about 3.10 a.m., as they were driving to work on their night shift, they saw a brilliantly lighted object descend from clouds, hover and approach them. They stopped the car, leaving the engine running, and got out. The numerous multi-coloured lights on the underside seemed to move along weaving, undulating, criss-crossing paths. Then the car's engine cut out and the headlights dimmed. The frightened witnesses were vainly trying to start the car when the object moved slowly away. Then the engine and the lights came back to life – but the radio was later found to be out of action, and remained so

**What lies behind the stories of UFOs interfering with vehicles? Hints emerge from computerised analysis of witnesses' reports – and, claims MARK RODEGHIER, they suggest that both natural and unnatural agencies play a role in these incidents**

COMPUTER ANALYSIS OF UFO REPORTS reveals relationships that are not immediately evident. Some of these can be displayed graphically: a diagram is drawn in which each feature that can appear in UFO reports is represented by a word or phrase in a box – 'disc' for a report of a disc-shaped object, 'disappear' for cases where the object vanished rather than moved away. Connecting lines link those features that tend to occur together – for example, a disc shape and a report of sound being heard during the sighting. In about a quarter of all the EM cases (cases of electromagnetic interference with vehicles) studied by the author, sound was reported. But where disc-shaped UFOs were involved, sounds were heard in 35 per cent of cases.

Dotted lines are also used, to connect



## A policeman's lot

Driving at 1.40 a.m. on 27 August 1979 through the flat countryside of north-western Minnesota, USA, deputy sheriff Val Johnson saw a bright light about 2½

characteristics that tend to 'avoid' each other – that is, they are found together less often than would be expected.

When the complete diagram is drawn up, 35 separate correlations are represented. After a few minutes' study three groupings emerge, each called a nexus.

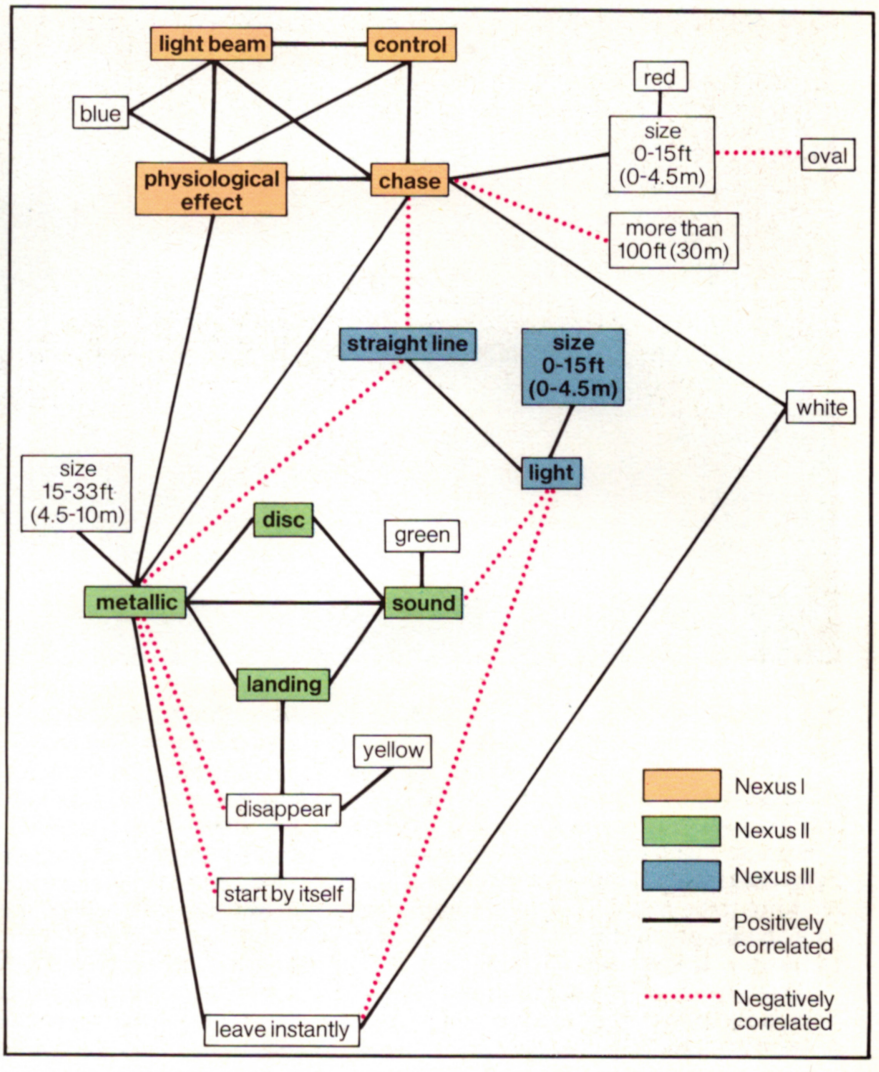
Nexus I, in the upper part of the diagram, reveals a tendency for light beams, physiological effects, control of the vehicle by the UFO, and being 'chased' by the UFO, to be correlated with each other.

What can the association of these four characteristics mean? Does it make good sense? The answer could be 'yes'. A beam of radiation might be able to affect the human metabolism and might be the means by which the UFO takes control of the vehicle (though all this smacks of science fiction). And it is not surprising that the UFO should chase the vehicle if it is to take control of it. And if controlling a vehicle requires a great deal of energy, it is understandable that the human organism should be affected. The incident near Öjebyn, northern Sweden, discussed earlier (page 2238) shows all the characteristics of Nexus I.

Nexus I can be understood on the assumption that the incidents involved are caused by physical events, and are not imaginary.

Next consider these four elements in an EM report: a disc-shaped UFO; a metallic appearance to the UFO; a landing; sound. These form a distinct nexus, Nexus II in the lower part of the diagram, almost as tightly bound as Nexus I. Common sense is not as helpful in considering the meaning of this nexus as it was previously. There seems to be no *a priori* reason to expect that, for example, sound should be associated with a disc-shaped UFO. But if we can entertain the possibility that some UFOs are physical objects, then Nexus II is telling us about metallic discs that emit sound, and also about metallic UFOs (of a variety of shapes) that land and emit sound. (The association between metallic appearance and a disc shape is a rather weak one, at the limits of statistical significance.) The overall pattern of Nexus II is very much like one classic type of 'flying saucer'; the incident at Warneton, Belgium, in 1974 (see page 2238) combined the features of Nexus II.

Other correlations that appear in the diagram strengthen the suspicion that Nexus II represents some physically real object. There is a 'negative correlation' between metallic appearance and disappearance – that is, these solid-looking objects tend to depart in a conventional manner. They also tend not to be associated with cases in which car engines start up spontaneously. These spontaneous start-ups are extraordinary, nonsensical happenings – like the vanishing of UFOs; it is not surprising that there is a correlation between these happenings in UFO reports. The fact that metallic-looking UFOs tend not to occur




Patterns that emerge from witnesses' reports of vehicle interference cases. Solid lines link features that are 'positively correlated' – more likely to occur together than would be expected by chance. Dotted lines link those features that seem to 'avoid' each other – thus sounds are relatively infrequently heard when a UFO appears as a light. Each 'nexus' is a group of correlated traits, possibly to be accounted for by its own separate agency

miles (4 kilometres) away, just above ground level. It was so bright that he suspected it was a downed aircraft and headed towards it. While he was still $1\frac{1}{2}$ miles (2.5 kilometres) distant, the light suddenly shot towards him. Within a fraction of a second it reached him, he heard the sound of breaking glass, felt his brakes lock, and lost consciousness.

When Johnson came to, he was leaning against the steering wheel, his eyes were hurting, and there was a bump on his forehead. The car had skidded across the road (left). At a nearby hospital a pinkish irritation was found on his eyes, like those caused by a welder's arc.

One of the car's headlights was smashed – yet the bodywork above was unscathed. The windscreen was cracked and two of the car's three aerials were bent through sharp angles. And both the car's electric clock and Johnson's mechanical watch were 14 minutes slow – having been correct earlier in the night. Johnson's case was the most remarkable of a wave of reports of balls of light 'attacking' cars in the northern Midwest.

Ball lightning appearing during a storm. This rare photograph of an elusive phenomenon was taken in the United States in 1933. Ball lightning is a favourite explanation for luminous UFOs and probably accounts for some of them; but it is possible that some unknown electrical process capable of occurring in clear weather is responsible for a greater number of 'ball of light' UFOs

in conjunction with such events counts in favour of Nexus II having a physical nature.

The third nexus that appears in the computer analysis involves UFOs that move in a straight line, are small – less than 15 feet (4.5 metres) in diameter – and are described as a light, lacking any apparent structure. They tend not to be metallic in appearance, not to emit sound, not to chase the vehicles, and not to leave instantly.

This cluster of events may not look too important on first examination. But there are reasons to expect some cluster of characteristics like Nexus III to exist. Many investigators have advanced the idea that the UFO phenomenon as a whole must have more than one type of cause. Underlying some sightings may be some type of natural phenomenon, as yet undiscovered. Philip Klass, famed as a UFO debunker, has suggested that many reports might be accounted for by plasma effects. (Plasmas are gases in which electrons have been stripped away from some of the atoms, so that there is a mixture of positive and negative electric charge present.) That hypothesis may indeed explain a few sightings, but not a majority of them. However, it would certainly be surprising if there were not at least a few EM events caused by some type of terrestial electromagnetic activity. Nexus III may be describing this unknown natural phenomenon.

There are about 14 cases in the author's catalogue of EM effects that correspond to Nexus III. Summaries of a few of these follow.

On 24 August 1978 a 54-year-old woman was driving along the Des Moines River, Iowa, USA. Suddenly, in a wooded rural area, her 1972 Ford stalled and came to a stop. The headlights also ceased to function and the windscreen misted over. Then a red-orange ball of light appeared, moving from east to west across the river and into the woods. It followed a straight trajectory and made no sound. The woman could make no estimates of size or distance, though she said the apparent size was that of the full Moon. Afterwards the car restarted without her turning the key.

Here is a very early event from Aimé Michel's work on the 1954 French UFO wave. On 14 October 1954 a reddish fireball passed over a car at Chazey Wood, near Gueugnon. As it did so the engine and the electrical systems failed simultaneously. After a few seconds the ball passed out of sight, the headlights came back on and the engine could be restarted. The ball made no noise as it passed by the car.

On 3 December 1980 Robert and Janice Lowrey, aged 25 and 19 respectively, were driving north in a rural area of Mississippi, USA, when Janice saw a ball of light approaching their car from the east at eye level. It was 12 inches (30 centimetres) in diameter, self-luminous, and white with a blue tint at the centre. It made no sound. The ball went over the bonnet of the car and vanished rapidly to the west, not deviating from its trajectory. The whole event took about 10 seconds. Immediately afterwards the heater in their car, a 1977 Monte Carlo, stopped working, the FM radio stopped producing sound except for weak multiple-station signals, the headlights dimmed so drastically that they could barely see 2 feet (60 centimetres) in front of the car, and the horn stopped working. Yet the engine remained unaffected. About 30 minutes after they had arrived at their destination everything on the vehicle functioned normally.

## Phenomenon without precedent

Nexus III events occurred mostly in rural areas, mostly in cool or cold weather, often when it was clear; most lasted less than 45 seconds, compared to a typical duration of 3 to 10 minutes for other EM events; and the UFOs involved were generally globular and travelled at steady speeds below 100 miles per hour (160 km/h).

These small, silent lights, moving in straight lines and interfering with electrical equipment and engines, have no precedent in the literature of meteorology or atmospheric physics. They could be the manifestation of some natural phenomenon with an undiscovered generating mechanism. They certainly do not look or act like extra-terrestrial spacecraft, or craft of any sort. No intelligence seems to control their actions. In appearance they are akin to ball lightning, but in their action and effects quite dissimilar. By contrast, Nexus I and Nexus II describe dramatic events involving large energies, seemingly deliberate acts of control of the affected vehicle, and metallic objects, often making landings. These are not the characteristics of any natural phenomenon, known or unknown to present-day science.

**Further reading**

Philip J. Klass, *UFOs – identified*, Random House (New York) 1968

Charles F. Lockwood and Anthony R. Pace (eds), *Vehicle interference project*, British UFO Research Association 1979

Mark Rodeghier, *UFO reports involving vehicle interference*, Center for UFO Studies (Evanston, Illinois) 1981

# Post script

**Your letters to THE UNEXPLAINED**

Dear Sir

As I am in the picture trade I was quick to spot the identity of the dead child in the photograph taken by Dr Hooper [below right], which appeared in Frederick Goodman's article 'Unexpected developments' in issue 95.

The 'spirit' is in fact from a painting by Charles T. Garland entitled *For you*, dated 1879 [below]. This and many other pictures of little girls were used extensively by the Pears Soap Company to advertise their products around the turn of the century.

The clairvoyant photograph is, I think, just a clever double exposure. Another ghost 'laid' I fear.

Yours faithfully,

*D. Gooch* Rochdale

*Mary Wickham of Romford, Essex, has also written to us to draw our attention to Charles Garland's painting. We sent both letters to Frederick Goodman for his comment and received this reply:*

I am grateful to Mary Wickham and D. Gooch for pointing to the undeniable resemblance between the 'spirit child' of the Dr Hooper photograph and the Garland painting. Little is known of Hooper, and so far as I know his work was never investigated. I should prefer to accept the thesis that the 'spirit picture' was indeed a not too clever hoax – albeit a cruel one to play – on the child's father. No specialist knowledge is required to see that the image does suggest either double exposure, or a partial exposure later completed to fill the plate.

I do not leap to these conclusions without a tremor of doubt, however. It is worth noting that experienced psychical researchers have so frequently encountered 'extras' that have been produced without any possibility of fraud, yet that resemble 'known' images (such as reproductions of paintings), that a theory that some might find far-fetched has been evolved to account for the phenomenon. Briefly, this theory holds that it is the spirits themselves who intervene to produce 'extras' – that is, such photographs are photographs *by* spirits, rather than merely spirit photographs. Further, it is postulated that the spirits may work using images that are derived from the rich stock of 'thought forms' on the mental plane.

Whether one subscribes to such a theory or not, it does account for some phenomena of which the majority of non-specialists are simply not even aware. It has always amused me that some of the photographs taken by Wyllie (many original prints of which I have personally examined) show 'extras' that in some cases bear traces of the dots familiar to us through the screen process in printing. The interesting thing is that these extras are claimed to be the recognised images of people who died long before either the screen process or indeed portrait photography was established. The more one looks into the world, the more things are revealed to be other than they at first appear. It is for this reason alone that I experience a tremor of doubt before pronouncing your correspondents correct in their suspicions.

*Perhaps the spirits – to take Frederick Goodman's point at face value – really do find communication with mortals an infuriatingly difficult business, as the shade of F.W.H. Myers also pointed out to Matthew Manning, and will seize on any means available in making their presence felt. On the other hand we should be equally loath to dismiss the possibility that many physical manifestations of psychic phenomena are tampered with by our old friend the cosmic joker. The presentation of proof of survival heavily veiled in the trappings of fraud would undoubtedly appeal to him. Somehow, though, it looks awfully like a hoax, doesn't it?*

Send *your* letters to THE UNEXPLAINED, Orbis House, 20–22 Bedfordbury, London WC2N 4BT

# Pathways to power

The cloud of a hydrogen bomb test explosion towers above the Pacific Ocean. Will a nuclear holocaust usher in the Last Days before the coming of the Millennium?

**Some of the intriguing new series that will be starting soon in *The Unexplained***

**A dream come true**
Johanna Bravant's dream of finding the body of a woman high in the mountains of Switzerland was disturbing enough. But the events that followed seemed like a living nightmare. For, within a few short weeks, the dream had come true in all its horrifying detail.
**See issue 114**

**A spirit take-over**
In the semi-darkness the face of the medium Queenie Nixon is 'transfigured' and takes on the form and features of the spirit communicator – young boy, old woman, middle-aged man. Is this extraordinary phenomenon proof of survival after death? **See issue 114**

**The end of the world is at hand**
Prophecies of the end of our planet – or at least of our present civilisation – have never been more plentiful. Some come through paranormal channels, some have biblical authority. **See issue 115**

**UFOs and megaliths**
Why is it that megalithic sites seem to 'attract' UFOs? A new study shows that most of these ancient monuments lie close to geological faults in the surface of the Earth. Is there a connection?
**See issue 116**

**Fads, fancies and reality**
There seem to be fashions in psychic manifestations as in all other things. Is it the phenomena that change – or the way we perceive them? An attempt at an explanation is in **issue 116**

**Sex and salvation**
Can the practice of sexual rites lead to the deepest philosophical awareness of one's relationship to the Universe? A report on the ancient Eastern belief of Tantra starts in **issue 117**

**Secrets in stone**
The supple grace of the buildings of the ancient Greeks stems from their use of a subtle system of harmonies. We examine the way in which this tradition surfaced in the arcane symbolism of medieval architecture. **See issue 118**

**Multiple and migrant selves**
'Just be yourself' is hard advice to follow if you are possessed by multiple personalities. How such cases relate to the apparent wandering of the spirit in clairvoyance is revealed in **issue 119**